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ABSTRACT

Involving 307 primarily Hispanic children with varying levels of English and Spanish language proficiency and 9 teacher-aide teams from grades 2-4 bilingual classrooms in schools located in 5 districts in the San Jose (California) area, the study examined whether classroom social status affected the frequency of study interaction and whether interaction, in turn, affected the amount of learning in a specific curriculum. Expectation States Theory analyzed the sources of status and their effects on peer interaction at learning centers in an ongoing classroom setting. A path model illustrated how classroom peer interaction can simultaneously have positive and negative effects on learning. The bilingual curriculum, designed to teach thinking skills, used math and science concepts and featured multiple learning centers each with different materials and activities. For one hour per day for 15 weeks, children were required to complete each learning center and to fill out accompanying worksheets. Instructions in English, Spanish, and pictographs were available with each learning center. Data were obtained from behavioral observations, questionnaires, and test scores. Findings indicated children with higher social status were more likely to talk and work together than children of lower social status; and the more children talked and worked together, the more they learned from the curriculum. (NQA)

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EXPECTATION STATES THEORY AND CLASSROOM LEARNING*

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Expectation States Theory and Classroom Learning

Elizabeth G. Cohen & Barbara Anthony

This study hypothesizes that classroom social status affects the frequency of student interaction; interaction, in turn, affects the amount of learning in a specific curriculum. Expectation States Theory is used to analyze the sources of status and to explain their effects on peer interaction at learning centers in an ongoing classroom setting. A path model illustrates how classroom peer interaction can simultaneously have positive and negative effects on learning. At the same time that talking and working together facilitates learning, children who have higher social status in the classroom have more access to interaction as a resource for learning.

The data for this analysis were taken from a large project studying the organizational conditions for implementation of a complex bilingual curriculum designed to teach thinking skills. This curriculum, Finding Out/ Descrubrimiento, was developed by Edward DeAvila; it uses math and science concepts in challenging tasks requiring repeated use of the same concepts in very different media and modes. The curriculum features multiple learning centers each with different materials and activities. Over a period of 15 weeks, for one hour per day, children are required to complete each learning center and to fill out the worksheet which accompanies the task. The learning centers are designed to operate simultaneously with four or five children working at each center.

Instructions are available with each learning center; they are printed in English, Spanish and pictographs.

Nine bilingual classrooms, grades two through four, participated in the project; there were 307 chidlren and nine teacher-aide teams. The schools were located in five districts in the San Jose area. Teachers were all volunteers from the staffs of schools that were members of the Bilingual Consortium, an organization that provides support for staff and curriculum development.

The classes were made up largely of children of Hispanic background with a small proportion of Anglos, Blacks and Asians. Parental background was working class and lower white collar. There were a few children from welfare families. Children had varying levels of language proficiency in English and Spanish.

The data used for this analysis were behavioral observations, questionnaires and test scores collected on a group of target children within each of the nine classrooms. There were actually two sets of target children selected for different purposes in each classroom. For the purposes of this analysis, the two groups are combined. The bases of selection were (1) varying levels of proficiency in English and Spanish and (2) selection by the teacher as likely to have the most difficulty in the math/science area. Measures of status were derived from a sociometric questionnaire given to all students in the fall of the experimental year.

Because all teachers and aides were bilingual and the materials for the curriculum were in two languages, the children who were not proficient in English had equal access to the learning resources. It is im-

portant to point this out, because in many bilingual classrooms, children who are not proficient in English are not able to interact on the task because they do not understand what is being asked of them and fail to comprehend the learning materials.

THEORETICAL ANALYSIS

When classmates interact on a school task, some students are more active and influential than others. Teachers and researchers have observed that these more dominant students are likely to be the high achievers and/or the more socially influential members of the class. In an early study, Zander and Van Egmond documented this effect in groups of third graders who were given the task of guessing the number of beans in a bottle. The investigators found that successful influence was related to having a higher IQ, having higher social power, and being male(1958).

It appears obvious that higher achievers would be influential on an academic group task; they are seen as expert by the group and are a valued resource for the success of the entire group. But why should socially influential children, or boys in comparison to girls, be treated as "expert" by the group? Sex and social power do not seem rational as a basis for perceived expertise.

Expectation States Theory, a general sociological theory, offers the educational researcher a way to analyze and explain these phenomena. Expectation States Theory (Berger, Cohen & Zelditch, 1972) attempts to explain the process by which status characteristics of group members

become the basis for expected competence on collective tasks. A large body of theory and research, mostly in laboratory settings, has provided extensive support for many of the propositions and derivations from the theory (For a review of this literature, see Berger, Rosenholtz & Zelditch, 1980).

A status characteristic is a generally agreed upon social ranking in which there are at least two ranked states. There are several different kinds of status characteristics; some refer to more general social distinctions such as race or sex----these are called diffuse status characteristics. Others are more specific and refer to distinctions of perceived ability on more specific tasks; the prime example of such a specific status characteristic in a classroom is reading ability.

Research shows that status characteristics, whether diffuse or specific, tend to become salient in new collective tasks where they have no direct relevance to the task at hand. This occurs through the medium of beliefs presuming superior competence of individuals with higher social status; these expectations regarding an indvidual's competence tend to generalize to group interaction on tasks having nothing to do with the status distinction. As a result, higher status individuals will be more active and influential than lower status individuals in the group task.

The theory specifies scope conditions; these are conditions sufficient for differential status to become the basis for organizing expectations for competence on new tasks. More than one actor must be involved in a collective task which demands that actors evaluate each other's contributions. Group members believe that the contributions

will afect the success or failure of the outcome. Finally the groups must be distinguished on at least one status characteristic.

Application of the theory to classroom interaction.

From a theoretical point of view there are multiple status characteristics which are capable of becoming salient in interaction in the classroom. First,there are differences in perceived expertise in the subject matter of the task at hand. If the teacher has assigned a task which the group sees as a math problem, then those with better grades in math will be deferred to as expert. They will be more active and influential than other group members. This is the operation of a specific status characteristic (such as perceived math ability) with a direct path of relevance to the task.(Humphreys & Berger, 1981)

Secondly, there are specific status characteristics which do not have a direct path of relevance to the task, but which are nonetheless capable of becoming the basis for expected competence on classroom tasks. Among elementary school students, perceived reading ability has been shown to function as a status characteristic in groups working on a task which requires no reading or other academic skill. Stulac first demonstrated this effect with students from different classrooms who were told that they performed "High" and "Average" on a test of reading ability. These ratings agreed with the students' self-ratings on a recruitment questionnaire asking about their reading ability in comparison to that of their classmates. In untreated four-person groups playing a simple board game that required collective decisions, the "Highs" were more active and influential than the "Average" students (Stulac, 1975).

Rosenholtz studied the effect of perceived Reading Ability on interaction among classmates. Each student was asked to rank all other same-sex students on how good they were in reading. She divided the students into High, Medium and Low on the basis of the average ranking assigned to each individual by classmates. Four-person groups were composed of children who were of the same sex and perceived social power and who were not close friends. Each group contained two students who held higher average rank on reading ability than the two other students. Groups were asked to play the same board game used in the Stulac study. Results showed that in the groups with High and Medium Readers, the Highs were more active and influential than the Mediums. Likewise, in the groups with Average and Low Readers, the Average Readers were more active and influential than the Lows (Rosenholtz, 1982). Reading ability was also found to act as a status characteristic in racially integrated classrooms; those who were seen as better readers were more active and influential on the board game in all-black groups and in interracial groups where whites were the High Readers (Cohen, 1982).

Reading ability is of central importance in elementary school classrooms because it often becomes a prerequisite for successful participation in instructional activities. Reading is often thought of by teachers and students as an index of how "smart" a student is. Thus it is not surprising to find that peers use perceptions of reading ability as an index of some more general problem-solving ability when they are engaged in group tasks in the classroom.

The level of consensus on ranking on reading ability has been shown to be related to the teachers' instructional practices (Rosenholtz &

Wilson,1980). The strength of this specific status characteristic appears to stem partly from the formal organization and evaluation system of the classroom. However, there are other status characteristics which originate in the informal social organization of the classroom. For example, some children are far more attractive and popular than others; attractiveness has been shown to function as a status characteristic.

[See Berger, Rosenholtz and Zelditch (1980) for a review of this literature.] In a sample of racially integrated classrooms, Cohen (1982) concluded that there were a number of alternative status characteristics that were capable of affecting the rate of interaction and influence on collective tasks. In many of these classrooms, there was a negative or insignificant relationship between rank on reading ability and rating of social influence.

A third status characteristic found in classrooms is the diffuse status characteristic. In mixed status groups of school children playing the board game described above requiring no academic skills, whites are likely to be dominant over blacks (Cohen,1972), Anglos over Chicanos (Rosenholtz & Cohen, 1982); Anglos over Canadian Indians (Cook, 1974); and, in Israel, Jews of Western origin over Jews of Middle Eastern origin (Cohen & Sharan, 1980). Lockheed has had rather mixed results in testing the effects of sex as a status characteristic among classmatess with the same task; sex appears to work as a status characteristic in younger schoolmates under conditions not yet well understood.[1]

An extensive research program on treating the operation of the status characteristics of race, ethnicity and reading ability has developed a number of interventions designed to produce equal status behavior in a mixed status setting such as the desegregated classroom. Two major questions of application have developed from this research program: Since very few classrooms use group tasks where authority is delegated to the student group, can one find evidence of the operation of status characteristics in the classroom when scope conditions concerning collective tasks are partly relaxed? Secondly, what is the relationship of the rates of interaction affected by the operation of status characteristics to learning outcomes? If the purpose of interventions is to increase the interaction of the low status student, will this result in improved learning?

Analysis of Collective Task Conditions in the Currriculum.

In the case of this curriculum, children were rarely assigned to work together and produce a joint product or to make joint decisions as in all the previous Expectation States work on school children. Instead, the children were working in shifting groups at learning centers. They were responsible individually for completion of the task and worksheet at each learning center.

However, there were some special features of the social structure that produced brief interdependencies between the students. Students were given the following two rules: You have the right to ask anyone at your learning center for help. You have the duty to assist anyone at your learning center who asks for help. Since the tasks were highly

challenging and always novel and the students were compelled to complete some performance, there was strong motivation for using each other as resources.

Grouping was temporary and heterogeneous. After finishing one center a student would select a new center that did not already have the posted limit of students working at it. This feature meant that students would have the chance, over time, to work with practically every other student in the class.

In general,the level of interaction was very high. However, in some classrooms, teachers were reluctant to delegate authority to lateral relations between students. In these classrooms there were fewer learning centers in simultaneous operation; the teacher attempted direct supervision by assigning groups to herself and the aide. Thus to some extent, the amount of interaction that a child could experience was a function of how willing the individual teacher was to "let go" and allow multiple learning centers to operate without constant supervision (Cohen & Intili, 1981)

Although it is not completely clear that the momentary interdependencies produced by this curriculum are the same as a collective task where the joint product forces participants to evaluate each other's contribution, it was decided to test the effects of status on the probability of talking and working together. Certainly, if a student is trying to make some experiment work successfully or to solve a problem, and s/he talks to a classmate to ask a question or to discuss what is happening, there is likely to be some evaluation of the usefulness of the classmate's reply. This is partly produced by the

necessity to "get the job done." If the situation were more permissive, and children were simply free to do what they wanted at the learning center, mutual evaluation would seem less likely. Thus this analysis tested the effects of status on interaction under what should probably be called "relaxed scope conditions" one might see in many classrooms.

Hypotheses

In testing the effects of status it was essential to control on more objective differences in relevant skill that might function as an important resource for students. The tasks in this curriculum called for some academic skills such as reading and computation in addition to many other problem-solving, reasoning, and manipulative skills, not well represented in conventional curricula. Thus it was important in testing any hypothesis on the effects of status on interaction, to control on relevant pre-test scores. The following hypothesis was tested:

Holding constant pre-test scores on a measure reflecting the curriculum content, the probability of talking and working together will be related to the status of the student.

Earlier analysis of implementation and learning had already demonstrated that the rate of talking and working together was related to learning outcomes among this set of target children. This was especially the case for the content-referenced test, called the Mini-Test (Cohen & Intili, 1981). We wanted to be able to describe the process whereby access to talking and working toether was partly governed by status. If our view of the process were correct, children with the same learning characteristics who were different in status characteristics could be shown to have differential access to an important channel of

learning. In order to describe the process we created and tested a path model adding the status effects to what we already knew were the major behavioral and pre-test predictors of learning on this curriculum.

MEASUREMENT

Learning Outcome Measures

A content-referenced test especially constructed to measure learning outcomes of this curriculum was used as dependent variable in the path analysis. In addition we used the California Test of Basic Skills, the standardized achievement test used in the fall and spring in these California classrooms. The measure of English proficiency was the Language Assessment Scale developed by DeAvila and Duncan. This test requires the child to tell a story in English and in Spanish. All three of these tests were administered before and after the curriculum.

Measures of Status

The sociometric instrument used in this study consisted of eight questions-- each followed by a list of students enrolled in that particular classroom. The Ss were asked, for example, to choose the students in their class who were "best at math and science." Or they were asked to select the students who "had the most trouble with reading." The students then identified their choices by circling the appropriate names on the list following each question. There was an English and a Spanish version of the instrument. Great care was taken in the administration of this instrument to be sure that each child could understand the directions and could recognize the names of classmates.

Since students could check off any number of names, there was a variable number of choices made for each criterion question between classrooms. The distribution of choices on each of the questions was divided into quintiles for each classroom. Each child was then assigned a score ranging from one to five, depending on the fifth of the distribution in which the number of choices s/he received lay. Measures of Interaction.

Observers visited classrooms during the operation of the curriculum once a week to score the behavior of target children. They used a special interaction scoring device for this purpose that measured performance outputs of the child relevant to the task. Interaction measures were closely related to the small group scoring system developed from the theory and used on small group interaction in more controlled settings.

The purpose of the target child observation was to obtain timed observation of task-related behavior. The observer began the scoring period for each child by recording the nature of the activity and grouping pattern in which the child was operating. If the child were found reading or writing during the three minute observation period, the observer checked this off on the coverpage. For each 30 second interval of a three minute period the observer would record the frequency of task-related talk, and the frequency of selected non-verbal behaviors: working alone or together on the curriculum, off-task behavior, as well as other behaviors not directly relevant to this analysis. In addition to scoring talk, the observer recorded whether the target of the talk was peer or adult.

The reliability of this instrument was assessed by the following formula:

$$\frac{\text{\# of disagreements of scorer with criterion scorer}}{\text{Total possible points of disagreement between two scorers.}}$$

The average percentage agreement for this instrument was .90 over the 24 times reliability was assessed.[1]

The two variables of interest here are the rate of task-related talk with peers and the observed frequency of working together on the curriculum with peers. A task-related speech was scored by a single check as long as it went uninterrupted by another student talking or by a change into talk that was not task-related within the 30 second interval. If the speech went on into the next time interval it was checked again. To calculate an average rate of talking across observations the total frequency of these speeches was divided by the number of observations for that child.

In order to be sure that there was sufficient stability in the measures taken of a given child to justify this aggregation procedure, an analysis of variance was carried out on frequency of talk for different obserservations taken on the same child. This analysis showed that there was more difference between observations taken on different children than within the set of observations taken on the same child ($F=1.39$; $p < .009$).

The other critical variable was the rate of working together with peers. As with the rate of talking, the child was a significant source

of variance in the frequency of this behavior per observation ($F = 1.28; p < .033$).of variance in the frequency of this behavior per observation ($F = 1.28; p < .033$). In order to estimate task-related interaction in an interdependent work relationship, we created an index from these two variables which we called Rate of Talking and Working Together. The index was formed as follows:

$$\left(\frac{\Sigma T}{N}\right)\left(\frac{\frac{\Sigma WT}{\Sigma B}}{N}\right)$$

T = Task Related Speech

N = Number of Observations for that S

WT= Works Together with Peer

B = All scored Activity(non-Verbal codes)

This index of talking and working together has the effect of weighting talk by the frequency with which it occurs in an interdependent context. The frequency of working together is standardized on the scores of all other non-verbal activities, such as off-task behavior, waiting for the teacher or works alone. If a child shifts frequently from one type of activity to another, the scoring scheme generates a higher frequency of working together than for a child who works steadily with another child throughout the observation. In order to prevent the former child from receiving a spuriously high score on working together, the frequency of working together is divided by the total number of activities checked.

RESULTS

Interrelationship of Status Variables

After classrooms were made comparable by assigning a quintile score for the number of choices made for each child on each criterion question, the status variables were intercorrelated. In this analysis, friendship choices are used as an indicator of an Attractiveness Status Characteristic.[2] Although athletic reputation has never been tested as a status characteristic, it was included here because of the high probability that it acts as an important basis for status among schoolchildren. Table 1 shows the correlation coefficients for the following criterion questions: Best in Reading; Most Trouble with Reading; Best in Math and Science; Best in Games and Sports; Best Friends. Table 1 also includes the correlations of each of these status criteria with the rate of talking and working together. This table is based on the larger sample when intercorrelations are made on the status variables. In the column with the behavioral measure the N drops to 101, the number of target children on whom we have systematic behavioral observations.

TABLE 1 HERE

Table 1 shows a very high level of intercorrelation between status criteria measured in the Fall. Children who were more frequently chosen on academic criteria were also more frequently chosen on friendship and athletic criteria. There is a correlation of .77 between being chosen

on Math and Science and being chosen on Reading. At first glance, it looks as if academic status might be the major basis for friendship choices and for choices of athletic status. However, it is equally likely that choices for academic status stem from friendship or athletic status.

Note the expected negative relationship between being chosen as a good reader and being chosen as a poor reader. We had originally ...ned to create a single status score on reading by combining the choices for the two questions; however, careful examination of the distributions of the choices for Low Reader showed that it was not really comparable to the choices for High Reader. We were therefore reluctant to combine the two scores.

All the status variables are significantly correlated with the rate of talking and working/together in the expected direction. The strongest correlation is between Math/Science and interaction (r=.243). This would be expected on theoretical grounds because the children were told that this was a Math/Science curriculum. Therefore, their choices on this question should have reflected students thought to be relevant experts in their classroom. In theoretical terms this was an indicator of a status characteristic with a direct path of relevance to interaction. However, the other status criteria are not markedly weaker than Math/Science.

Test of the Status Hypothesis

In order to test the hypothesis on the effect of status on interaction, holding constant pre-test scores, we chose to create a compound

status score of the Attractiveness Status Characteristic and the Math/Science Characteristic. This decision was made on theoretical grounds. In a multi-characteristic situation, actors will combine characteristics, present in the situation, that have direct and indirect paths of relevance to the tasks (Humphreys and Berger, 1980).

We chose the Math/Science Characteristic for its direct path of relevance. We did not include the Reading Characteristic because it was too highly correlated and would amount to counting the same characteristic twice. It is possible that there is one underlying academic status characteristic, of which Reading and Math are simply two reflections. The overlap of skills in the conventional math and language arts curriculum no doubt helps to create this situation.

As mentioned above, there is no study showing the effect of Athletic Status on collective tasks. Therefore we chose to combine the measure of the Attractiveness Status Characteristic with the Math/Science Characteristic. In this way we could reflect at least one of the alternatives to academic ability as a source of status in the classroom. We simply added the quintile score on the two status characteristics for each target child.

Table 2 shows the regression of Talking and Working Together on the new status variable, which we shall call CoStatus, and on the pre-test score of the content-referenced Mini-Test. Costatus has a statistically signficant beta weight, but the pre-test score does not. The R_2 accounted for by these two variables is very small. The rate of talking and working together is greatly influenced by the way in which the

teacher implemented the curriculum. There is no measure of this classroom variable represented in the regression.

TABLE 2 HERE

The Path Model

The path model depicting the hypothesized relationships between status, interaction and learning is presented in Figure 1. The path coefficients have been entered into the diagram. Not all the relationships pictured in this model were clearly hypothesized prior to testing. It was clear because of the theoretical framework of the study that the measures of status taken in the fall were causally prior to the observed rate of talking and working together. This behavior, in turn, was an antecedent variable of the test on the curriculum given in the spring.

FIGURE 1 HERE

Prior analysis of learning outcomes had shown the powerful effects of pre-test on post-test scores as well as the importance of the observed frequency of reading and writing on post-test scores (Cohen & Intili, 1981). We also knew of the high level of intercorrelation of the various pre-test measures. The zero order intercorrelations of all the variables represented in the path model may be seen in Table 3. The number of subjects differs for the different correlations. There were some missing test score data on target children causing us to drop them

from the regressions containing these variables. The N represented in the table is the N on which we calculated the regression prepresented by the path coefficients. There was a somewhat different N for different regression equations because of differences in the missing data for the variables involved.

TABLE 3 HERE

We did not have strong a priori notions of the role of the various pre-tests in the model. Therefore, we tried a number of different patterns before we found one which neither over nor underestimated the observed relationships. The final model in Figure I provided very close estimates of the observed correlations when the expected correlations were recomputed by combining the paths in the model. See Table 4.

TABLE 4 HERE

The path coefficients in the model provide strong support for a conception of peer interaction as a consequent of status and an antecedent of learning. The signficance of the path between interaction and learning is particularly important in light of the multiple controls; other significant predictors of the post test score are the Mini-test pre-test score, the CTBS Reading pre-test score and the observed frequency of reading/writing.

The level of English proficiency in this model, is causally prior to both the CTBS Read (administered in English) and the Mini-test pre-test (but not the post-test). The Mini-test was administered in either English or Spanish and did not require the student to be able to read. Nonetheless, both English proficiency and the reading achievement are significant predictors of the pre-test score on the Mini-Test.

The relationship between the status variable and the Mini-test score is pictured as a double-headed arrow in this model. To some extent, both variables undoubtedly reflect prior academic evaluations and "objective knowledge." In this model background intellectual and achievement variables are represented by the CTBS score and English proficiency. Several alternative models which attempted to link the reading achievement score or the English proficiency score directly with the CoStatus variable resulted in a failure to recompute the observed correlations.

DISCUSSION

Effect of Status on Peer Interaction

The data show a clear relationship between status characteristics and peer interaction, even when the amount of knowledge about the curriculum prior to its start is controlled. Children who are in the hgh state on one or more status characteristics are more likely to be found talking and working together with peers than children who are in lower states of the status characteristics. The results are supportive of the proposition that even the momentary interdependencies of students in

this classroom setting are sufficient to make status characteristics salient and relevant to expected competence on the curricular tasks. In the most recent review of Expectation States Theory, Berger, Rosenholtz and Zelditch list the scope conditions of the theory. The status organizing processes they describe will take place at least under the following conditions: Groups are engaged in tasks, i.e. actions in which there is (a) a goal, (b) some idea of the difference between success and failure in achieving the goal, and (c) some idea that the contributions of group members affect success and failure in achieving it. A second major scope condition is that the theory deals only with groups, i.e. sets of two or more individuals who think of themselves as jointly responsible for the outcome and who are therefore oriented toward a collective decision (1980).

In this instance, the student was not jointly, but individually responsible for a final product (the worksheet). The situation we have studied meets these scope conditions only if one defines as "the collective task" the much smaller unit of the specific question or problem that brought the children into conversation, perhaps just for a few moments. Typical comments between children might be one of exasperation over why the balance scale did not "balance," arguments over whether the measurement had been done correctly, or even seeking out help on the worksheeets: one child was heard to ask another: "What's the answer, dummy?"

Even though these would not ordinarily be seen as collective tasks, they appear to be sufficient to activate status organizing processes. This is significant from a theoretical and an applied point of view.

Theoretically, the scope condition might well be described more loosely as a situation that forces people to make evaluations of each other's contribution, whether or not the group or the individual is responsible for the end product. From an applied point of view, this is the first time that the operation of status characteristics has been clearly documented in a normal operating classroom. Therefore the theory can be used to illuminate, not only formal groupwork tasks in classrooms, but more casual task-related peer interaction processes as well.

When applying this theory to the classroom, one must take into account the curious nature of multiple status characteristics in this setting . The intercorrelations of status characteristics suggest that there are multiple sources of status with similar effects on peer interaction. Furthermore, there is a "snowball" effect moving from the high state on one status characteristic to the high state on another. Thus we have found correlations between being seen as good in games or sports, or being popular as a friend, and receiving high ratings on academic criteria.

Because of some peculiar features of the bilingual classroom it is possible to disentangle this process. Children who are not proficient in English receive, not surprisingly, lower numbers of choices on being good in math and reading than children who are fully English proficient. Yet there are many individual exceptions; some popular children who are not English proficient receive high ratings on academic criteria. Detailed examination of cases suggests that status can spread from the informal organization of the classroom to the academic status order.

There is not quite as close a connection between reading status and actual reading test scores for the less English proficient students (r = .37) as for the English proficient students(r = .47). For the less English proficient students, there was a significant partial correlation coefficient between reading status and interaction, controlling on the pre-test reading score(.216; $p < .05$; N = 73). For the fully English proficient, the correlation between perceived reading status and actual reading score was so strong, that when the reading score was partialed out, there was no relationship between the status score and interaction (.006; N = 26).

A common question raised by critics of work on reading ability as a specific status characteristic is: How do you know that the observed dominance of students with high reading status is due to status and not to some more objective resource represented in measured reading achievement that is actually more valuable to the group? Because classmates' rankings on reading ability are typically so closely related to teacher's rankings and to objective test scores, it is usually impossible to pull them apart with correlational techniques. In this case of children who are not proficient in English, there is a sufficiently loose relationship between status and test scores, to highlight the effects of status on interaction.

Sex as a Status Characteristic

Sex did not appear to operate as a status characteristic in this classroom setting. There were no sex differences in being chosen as good in math and scince. When the Math/Science status characteristic

was held constant, there were no effects of sex on the observed rate of talking and working together or on post-test scores. Lockheed has found similar results in elementary school classrooms.[3] The equal or superior academic achievement of girls in the elementary school setting may act to modify the effects of sex as a status characteristic in the school setting. This is not always the case, as was seen by the strong sex effects in the early Zander and Van Egmond study (1958).

The Path Model

The relationship of peer interaction to learning is of special significance to the educational researcher. The more the children talked and worked together, the more they learned from the curriculum. The path coefficient between the interaction index and the post-test score remained statistically significant despite the strong controls on two pre-test scores and the observed frequency of reading and writing. The potential of peer interaction for conceptual learning cannot be overemphasized at this time when the height of educational fashion is the return to direct instruction. The direct instructional model completely ignores the educational potential of lateral relations between students.

It should of course be kept in mind, that learning took place among the peers partly because there were superbly engineered and pre-tested learning materials at hand for the peers to talk about. The curriculum was built on careful developmental and learning principles; all the materials were prepared in advance so that students had only to open the box for each learning center. The researcher who wishes to document

learning gains as a result of peer interaction would do well to keep this point in mind.

Peer interaction probably had multiple functions in the context of this curriculum. It surely acted to reduce uncertainty as the children found their way thru the complex directions on novel tasks. As in the organizational literature, interdependence of the workers is highly effective in reducing uncertainty when the task is complex. Other analyses of the data suggest special benefits of interaction when the dependent variable under consideration is conceptual learning. For example, holding constant the pre-test score, interaction is related to the CTBS math post-test score on word problems (Math Applications), but not to the score on computation. The mini-test used in the path model represents a combination of the concepts of the curriculum and new scientific and mathematical vocabulary. In addition to assisting the children with the understanding of the concepts, interaction probably gave them a chance to commit the new vocabulary to working memory.

Why did reading and writing have an effect on the post-test score? Reading and writing reflected the filling out of worksheets and the finishing of more learning centers. Reading and writing are partly an indicator of the implementation of the curriculum in that classroom and partly an indicator of the educational value of filling out the worksheets. The more worksheets a child completed, the higher was his/her post-test score. It was also the case that some classrooms put much more emphasis on worksheets than others (Anthony et al, 1981).

At the same time that the path model depicts the favorable effects of peer interaction on learning, it shows the negative effects of sta-

tus. In this interactional system, those children with higher social status have more access to peer interaction that, in turn, assists their learning. In other words, the "rich get richer." This is the dilemma of using of peer interaction; at the same time that it increases engagment and provides a strong potential for learning, it makes the status structure of the classroom salient and allows it to become the basis of the prestige and power order within the interacting classroom group.

The simplest and most effective treatment for this problem, developed from Expectation States Theory, is the use of a "multi-ability" introduction to the peer interaction. If children can be made to understand that there is not just one ability that is relevant to new learning tasks, but a number of unrelated abilities, then expectations on the basis of pre-existing status characteristics will be weakened as they combine with the mixed expectations based on multiple relevant abilities (Cohen, 1982; Rosenholtz, 1982).

In the three-day workshop prior to the curriculum, teachers were warned about the possibility of status effects. They were told how to give multi-ability introductions. However, they were so busy trying to stay one step ahead of a dozen or so new learning center tasks every week that they never followed this instruction. To the contrary, we even observed some teachers assigning good readers to each learning center to help the others, thereby leading the children to think that good readers would clearly be superior on the curriculum tasks. In the future implementation of the curriculum, considerable time will be spent

in having teachers practice these multi-ability introductions to each learning center.

Test Scores in the Model. Figure 1 illustrates the pattern of test scores providing the best fit to the data. The reason that the English proficiency score and the Reading Score are causally prior to the Mini-test, even though the Mini-Test did not require understanding of English or reading skill, lies in the nature of the Mini-Test. There was a strong vocabulary component; children who are not proficient in English are not necessarily highly proficient in Spanish. Many of the children were scored as having limited skills in both English and Spanish. Even if they spoke Spanish fairly well, they were unlikely to know scientific terms in Spanish. Many of these terms in Spanish were new to the bilingual teachers. Thus, limitations in vocabulary would effect both the reading score and the mini-test score. The reading score retained a direct effect on the post-test score (.27) although less than its effect on the pre-test score(.45). It also had an indirect relationship to the post-test score which was mediated by observed reading and writing. The curriculum required the children to read and write; obviously deficiencies in reading skill lowered the probability of these behaviors. It was nonetheless true that the frequency of reading and writing served to increase scores on the CTBS Math and Reading tests (Cohen & Intili,1981). In other words, there was opportunity to improve basic skills for students who had low scores on reading achievement thru the literacy activities in the curriculum..

CONCLUSIONS

Expectation States Theory provides a useful basis for understanding peer interaction in classroom settings. Even when interaction is momentary as at learning centers where peers assist one another or discuss what should be done, the conditions are sufficient to activate status characteristics so that they generalize to the new tasks. The analysis supported the hypothesis that children with higher social status are more likely to talk and work together than children of lower social status, holding constant a measure of knowledge relevant to the curriculum in question.

Using a path model, we were able to show a good fit between the model and the data. The more the children talked and worked together, the more they learned as measured by the post-test score. At the same time that this relationship could be seen in the data, it was also the case that children with higher social status had more access to this valuable medium for learning----peer interaction--than children who were less attractive to their peers or children who were seen as less able in math and science.

The model was also able to picture the multiple sources of learning gains in the curriculum. In addition to peer interaction and prior knowledge and academic achievement, the reading of curriculum materials and the filling out of worksheets was found to be predictive of learning gains. The model illuminates the key sources of learning gains in a classroom organized around multiple learning centers with considerable authority delegated to the individual learner and to lateral relations between learners.

Finally, the model strongly implies that if peer interaction is to be maximally effective in promoting learning of all students, then status effects must be treated. Although we have a body of knowledge on how to modify these status effects, we have yet to find out effective ways to persuade teachers to use these techniques.

FOOTNOTES

1. The reliability of the target child instrument was assessed in two phases. In the first phase, each classroom observer was paired with a supervisor who scored alongside the observer. No observer was allowed to score on his/her own until a satisfactory level of agreement with the supervisor's scoring was reached. This was calculated by comparing the total number of checks made by the observer and the supervisor for a scoring period for each category on the scoring instrument. An acceptable level of agreement was defined as .90. During the actual scoring, each observer received visits from one of the supervisors. Reliability checks were made at that time.

2. Attractiveness does not mean only physical attractiveness. We argue that any child who receives many choices as "best friend," can certainly be described as highly attractive to other children.

3. Personal communication from M. Lockheed, ETC, Princeton, New Jersey.

BIBLIOGRAPHY

Anthony, Barbara; Cohen, E.G.; Hanson, S.G.; Intili, J.K.; Mata, S.; Parchment, C.; Stevenson,B.; & Stone, N. "The Measurement of Implementation: A Problem of Conceptualization." Paper given at AERA Los Angeles, CA. April, 1981.

Berger,Joseph; Cohen, B.P.; Zelditch,M. Jr. Status characteristics and social interaction. Am. Sociol. Rev., 1972, 37, 241-255.

Berger, Joseph; Rosenholtz S.J.; Zelditch, M. Jr. Status organizing processes. Ann. Rev. Sociol., 1980, 6, 479-508.

Cohen, Elizabeth G. Interracial interaction disability. Hum. Relat., 1972, 37, 648-655.

Cohen, Elizabeth G.; Sharan, S. Modifying status relations in Israeli youth. J. Cross-Cult. Psychol. 1980, 11, 364-384.

Cohen, Elizabeth G.; Intili, J.K. Final Report to NIE: Grant# G-80-0217 Interdependence and management in bilingual classrooms. School of Ed., Stanford Univ., Stanford, Ca.,1981.

Cohen, Elizabeth G. Expectation states and interracial interaction in school settings. Ann. Rev. Sociol., 1982, 8, In Press.

Cook, Thelma Producing equal status interaction between Indian and white boys in Britisch Columbia; An application of expectation training. PhD thesis. Stanford Univ., Stanford, Ca., 1974.

Humphreys,Paul; Berger, J. Theoretical consequences of the status characteristic formulation. Am. J. Sociol., 1981, 86, 953-983.

Rosenholtz, Susan J.; Wilson, B. The effects of classroom structure on shared perceptions of ability. Am. Ed. Res. J..1980, 17, 175-182.

Rosenholtz, S.J. Treating problems of academic status. In Status, Attributions, and Justice, ed. J. Berger, M. Zelditch, Jr. New York: Elsevier, 1982, In press.

Rosenholtz, Susan J.; Cohen, E.G. Status in the eye of the beholder. See Rosenholtz, in press.

Stulac, Julie. The self-fulfilling prophecy: Modifying the effects of academic competence in task-oriented groups. Ph.D.thesis. Stanford Univ., Stanford,Ca., 1976.

Zander, A; Van Egmond, E. Relationship of intelligence and social power to the interpersonal behavior of children. J. Ed. Psychol., 1958, 49, 257-268.

TABLE 1

Intercorrelation of Fall Status Measures and Rate of Talking and Working Together

	Read High	Read Low	Math/Sci High	Friends High	Sports High	Talk/Work
Read High[1]	1.00	-.562***	.770***	.558***	.448***	.221*
Read Low		1.00	-.49***	-.364***	-.182**	-.213*
Math/Sci High			1.00	.502***	.571***	.243**
Friends High				1.00	.502***	.209*
Sports High					1.00	.198*
Talk/Work Together						1.00

1. Read High represents the frequency of choices received by each child from classmates on who was best in reading. The choices in each classroom are converted to quintile scores in order to standardize for varying number of choices between classrooms.

* $p < .05$
** $p < .01$
*** $p < .001$

TABLE 2

Regression on Working and Talking Together
of CoStatus and Mini-Test Pre-Test Score

Predictor	Beta Weight	F Value	R^2
Mini-Test A	.067	.385	.026
CoStatus	.248	5.275**	.079

N = 97

** $p < .01$

TABLE 3

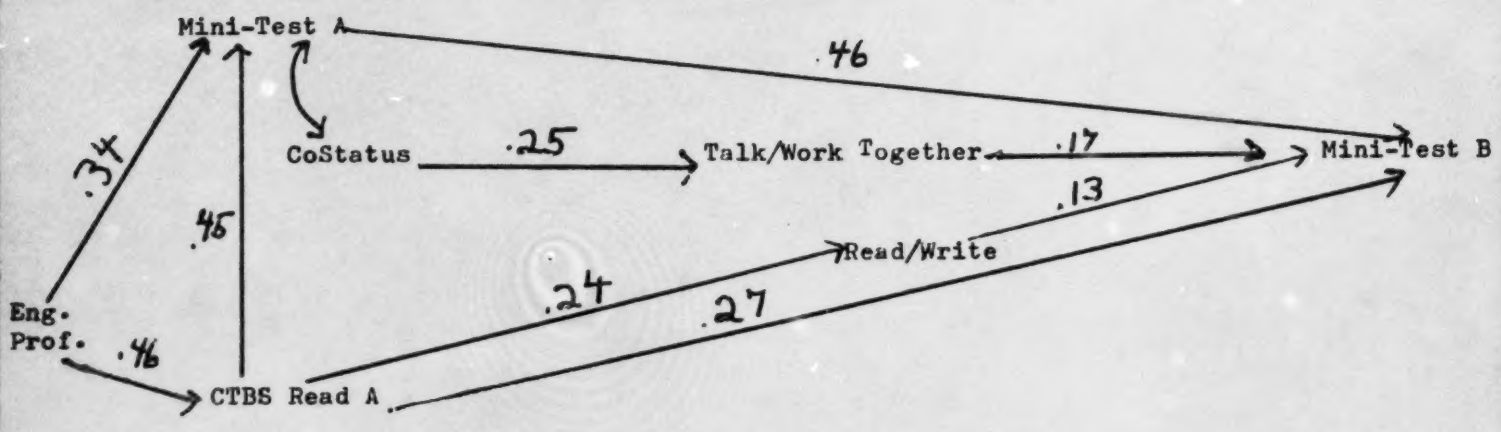
Intercorrelation of Variables in Path Model

	Mini-Test B	Talk/Work	Read/Write	CoStatus	Mini-Test A	Eng.Prof.	CTBS Read
Mini Test B	1.00	.217*	.220*	.338***	.641***	.530***	.583***
Talk/Work	76[2]	1.00	.027	.274**	.087	.206*	.023
Read/Write	76	76	1.00	.269**	.036	.090	.238*
CoStatus	93	93	79	1.00	.380***	.221*	.232*
Mini-Test A[1]	76	76	76	93	1.00	.545***	.607***
Eng. Prof.[1]	95	95	79	79	95	1.00	.460***
CTBS Read[1]	76	76	76	79	76	81	1.00

1. All these test scores are pre-tests, taken before the curriculum.
2. The N's are given in the bottom half of the table.

* $p<.05$
** $p<.01$
*** $p<.001$

FIGURE 1



Path Model: Effects of status, interaction and pre-test scores on Content-Referenced Test

TABLE 4

Expected and Observed Correlation Coefficients for Path Model

Variables Correlated	Expected Correlation	Observed Correlation
Mini-Test A/ Mini-Test B*	.652	.641
Talking and Working Together/ Mini Test B	.231	.217
CTBS Read/ Mini-Test A	.606	.607
Read and Write/ Mini-Test B	.212	.220
Eng. Proficiency/ Mini-Test A	.540	.545

* Mini-Test A is the pre-test score; Mini-Test B is the post-test score.